

REMARKS

This application has been carefully reconsidered in view of the Office Action of June 8, 2004. In response to the obviousness-type double patenting rejections based upon claims found in U.S. Patent Nos. 6,646,175, 6,646,176 and 6,713,658, applicants submit herewith terminal disclaimers against each of these three patents. With respect to the provisional double patenting rejections based upon claims found in application serial nos. 206,218 and 206,216, attention is respectfully invited to the procedure set forth in MPEP §804 and §822.01 which make clear that actual rejections are not involved. These MPEP provisions are understood to be consistent with the appropriate practice as set forth in *In re Mott*, where the court stated with respect to a provisional double-patenting rejection:

We have trouble understand the PTO's stated rationale for making the double patenting rejection final at this time. Once the provisional rejection has been made, there is nothing the examiner and the applicant must do until the other application issues.
190 USPQ 536, 541 (CCPA 1976)

Here, neither of the other applications involved in the provisional double-patenting rejections have issued, and accordingly, there is no actual double-patenting rejection to be considered at this time. As stated, for example, in MPEP §822.01, double-patenting can occur only when one application issues as a patent "thereby converting the 'provisional' double-patenting rejection in the other application(s) into a double-patenting rejection at the time the one application issues as a patent." Nevertheless, in order to expedite the prosecution of this application, once the other applications are indicated to be in condition for allowance, the double-patenting issues will be addressed.

Turning now to the prior art rejection, the rejection of claims 15-22 as unpatentable over EP109060 in view of U.S. Patent No. 3,506,400 to Eberly, Jr. et al. is respectfully traversed. The rejection based upon prior art appears to substantially repeat the Examiner's comments as found in the Office Action of October 22, 2003. In order to provide a complete record, a complete

response to the Examiner's comments in support of the rejection as found in pages 2-4 of the Office Action is provided below. Further, in view of the Examiner's additional comments found under the heading "Response to Arguments," the particular points raised here are responded to later in these remarks.

With respect to the rejection of claims 15-22 under 35 U.S.C. 103 as unpatentable over EPO 109060 in view of Eberly, applicants would respectfully submit that the combination of EPO 109060 and Eberly does not negate patentability of applicants' invention as set forth in the claims for two reasons. First, the proposed combination of EP '060 and Eberly involves a hindsight reconstruction of prior art teachings which becomes possible only after a consideration of applicants' disclosure. This is evidenced by the fact that the secondary reference, Eberly, is not directed to MFI-type catalysts and only suggests silicon/aluminum atomic ratios which are much lower than those specified in EP '060 and required in applicants' claims. Secondly, the proposed combination of prior art teachings would not result in a process in which a pre-treated catalyst as called for in applicants' claims is contacted to produce an effluent containing a propylene in which the propylene yield is from 30 to 50% based on the olefinic content of the feedstock as required in each of applicants' independent claims 15 and 21.

Considering the first point initially, as described in applicants' specification, for example, in the paragraph bridging pages 13 and 14, the procedure of steaming and de-alumination of the catalyst by treatment with a complexing agent provides a technique for de-alumination within the pore volume of the catalyst framework so that it occurs substantially throughout the catalyst framework and provides a very high silicon/aluminum atomic ratio within the range of 180-1,000. Thus, the required procedure as set forth in each of applicants' claims involves steaming and treatment with a complexing agent. The steaming step reduces the tetrahedral aluminum in the catalyst framework and converts the aluminum into octahedral aluminum in the form of

amorphous alumina. The subsequent treatment with the complexing agent complexes the alumina in a water soluble complex, which is removed from the catalyst framework. The patent to Eberly, while involving a steaming and complexing procedure applied to an aluminosilicate zeolite (although not to one of the MFI structure type), does not involve a treatment for the removal of amorphous alumina from the pores of a crystalline silicate framework to arrive at a high silicon/aluminum atomic ratio. Instead, Eberly involves only a modest decrease in aluminum content of the zeolite treated to increase the silicon/aluminum ratio (stated in terms of the silica/alumina ratio) only to a value that is substantially below the minimum ratio called for in applicants' claims. Further, the proposed combination of Eberly with EP '060 involves a hindsight reconstruction of prior art references that is clearly based only on a consideration of applicants' disclosure. As set forth in applicants' independent claims 15 and 21, the procedure of steaming and treatment with a complexing agent, as employed in applicants' invention, involves de-alumination to remove aluminum from the crystalline silicate framework to increase the silicon/aluminum atomic ratio to at least 180, corresponding to a silica/alumina ratio of 360. The patent to Eberly does not disclose de-alumination within the pore volume, and the reference procedure results in a much lower silicon/aluminum ratio.

Eberly does not specify the removal of aluminum from the pores of the zeolite but only from the "lattice structure" so it may be that Eberly is directed primarily to a surface-treating procedure to result in a relatively low silica/alumina ratio. In this respect it will be noted that the reference in Eberly to the production of zeolites having "extremely high silica/alumina mole ratios," as found, for example, in column 11, line 1, *et seq.*, must be considered in the context of what Eberly actually discloses to be an "extremely high" silica/alumina ratio. This is characterized, for example, in column 7, lines 34-40, as being a silica/alumina ratio of about 20 or in column 7, line 73-75, as a silica/alumina ratio of 29/1. Further, it will be noted that Eberly

in Figure 4 shows the effect of silica/alumina ratio on unit cell size. Here, the decrease in unit cell size effectively flattens out when the silica/alumina ratio reaches a maximum of about 40. Again, whatever teaching can be gleaned from Eberly, it is clear that the reference suggests to one of ordinary skill in the art that the maximum silica alumina ratio should not exceed somewhere in the nature of 40, equivalent to a silicon/aluminum atomic ratio of 20.

The patent to Eberly does not disclose that the amorphous alumina is removed from throughout the pore structure, and it is evident that this does not happen. Perhaps this is due to the fact that in Eberly a templating agent is in place at the time of the steaming and complexing procedure. This would appear to be indicated by the EDTA extraction data shown in Table 3, column 7 of the Eberly patent. As indicated there, after 32 hours of extraction, the silica/alumina ratio is very low, and even after 184 hours, the silica/alumina ratio is still only 8.7 in the case of the “non-calcined” material and only 20 in the case where the material was treated to a wet air and steaming procedure. For whatever reason, it is evident that the aluminum is not removed from the pores of the crystalline silicate as in the case of the MFI crystalline silicate catalyst employed in applicants’ invention. It further will be recognized that the patent to Eberly does not disclose the treatment of MFI crystalline silicates. In this regard, reference is made to *Atlas of Zeolite Structure Types* by Meier et al, published in 1978 by the Structure Commission of the International Zeolite Association submitted as Exhibit B in applicants’ previously filed Appeal Brief of January 24, 2003. Eberly discloses the treatment of mordenite, faujasite, chabazite, gmelinite, analcite, erionite, and zeolite-Y. As indicated on pages 89-93 of the above Exhibit B, not even one of these zeolites has the MFI-type crystalline structure.

For the reasons advanced above, it is respectfully submitted that the proposed combination of EP ‘060 and Eberly cannot be made in a manner to arrive at applicants’ invention as set forth in the claims (involving heating in steam and dealumination by treatment with a

complexing agent) even if it were proper to use applicants' disclosure as a basis for combining the diverse teachings of the references. However, assuming for the sake of argument that EP '060 and Eberly could be selectively combined in a manner to arrive at applicants' invention, it is believed clear that this cannot be done in a manner consistent with the proper standard to be applied in combining prior art teachings. This standard forbids using an applicants' own disclosure as a basis for assembling prior art teachings and requires a suggestion or motivation in the prior art as reflected in decisions in *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 USPQ 929 (Fed. Cir. 1984) and *Ex parte Giles* 228 USPQ 886 (PTO Bd. Of Appeal. And Int. 1985). As expressed by the Board in *Giles* at 688:

Only appellant's disclosure and not the prior art provides a motive for achieving the combination as claimed by the appellant. To imbue one of ordinary skill in the art with knowledge of the invention . . . when no prior art reference or references of record convey or suggests that knowledge is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

Attention is also respectfully invited to the Federal Circuit decision in *In re Fine*, 5 USPQ2d 1956 (Fed. Cir. 1988) wherein the Court stated at 1600:

It is essential that "the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made . . . to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *Id.* One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. (Emphasis added)

The admonitions in *Ex parte Giles* and *In re Fine* are to step back in time to evaluate the invention only in the context of what is disclosed in the references without regard to what is disclosed in applicants' specification. When this is done, it is believed clear that one of ordinary skill in the art would not arrive at applicants' invention based only upon the references and "the then-accepted wisdom in the art." Eberly, as noted above, does not involve treatment of an MFI-type zeolite. Further, Eberly does not involve a process involving the production of propylene,

or any other olefin, from an olefin containing heavier feedstock. Zeolites of the MFI structure type are not disclosed in Eberly, but even if they were, the fact remains that the secondary reference contains absolutely no disclosure regarding the cracking of olefinic feedstocks to produce lower molecular weight olefins of any kinds. Thus, it is clear that the prior art references provide no suggestion or motivation to attempt to combine the prior art teachings to arrive at applicants' invention.

The diverse teachings of EP '060 and Eberly serve to emphasize that only hindsight is involved in attempting to combine the teachings of these two references. As is well established, it is incumbent upon an Examiner when proposing a combination or modification of references to identify some suggestion in the art to combine the references or make the combination. Attention in this regard is invited to *In re Mayne*, 41 USPQ2d 1451, 1454 (Fed. Cir. 1997). As noted previously, Eberly is not directed to MFI structure type zeolites and indicates that the zeolites should have much lower silica/alumina mole ratios than those required by EP '060 and of course, much lower than those called for in applicants' claims at issue. While Eberly discloses that higher silica/alumina mole ratios provide greater stability, the "higher" silica/alumina mole ratios suggested by Eberly are much lower than the lowest silica/alumina mole ratio suggested by EP '060. It is clear that there is nothing in the prior art by way of reasoning, suggestion or motivation to support the view that one of ordinary skill in the art would have modified the process of EP '060 with catalysts already possessing silica/alumina atomic ratios greater than 175 with the catalyst pretreatment of Eberly, when Eberly teaches much, much lower silica/alumina ratios to provide sufficient stability. Accordingly, it is clear that the Examiner has not presented convincing reasons for the proposed combination of references and no *prima facie* case of obviousness has been established.

In summary, it is evident that the EP '060 and Eberly references are directed to procedures which themselves are totally diverse from one another as well as being totally unrelated to applicants' invention. There is in the first instance nothing in the prior art references which would suggest their combination of teachings in an effort to arrive at applicants' invention. In fact, it is difficult to see how the Eberly process directed to treatment of zeolites which do not have MFI structures to produce very low silicon/aluminum atomic ratios could be incorporated in any manner in the EP '060 process. The only disclosure which would even remotely suggest to one of ordinary skill in the art that the teachings of these two references be combined is found in applicants' specification and not in the prior art.

Finally, if one assumes that EP '060 and Eberly can be combined without the sort of hindsight reconstruction condemned by the Board of Appeals and Patent Interferences and the Federal Circuit, the result of combining these prior art teachings still would not lead one of ordinary skill in the art to applicants' invention. Each of applicants' claims requires a propylene yield on an olefin basis of from 30 – 50% based upon the olefinic content of the feedstock. As noted previously in the prosecution of this case, the EP '060 reference does not disclose a propylene yield as claimed, nor is such a propylene yield inherent in the operation of the prior art reference. This appears to be acknowledged in the first full paragraph found on page 4 of the Office Action immediately preceding the double patenting rejections. The argument apparently made in the Office Action that the claimed propylene yield would “naturally be produced” finds no support in the prior art references. Further, even if the teachings of the two prior references could be combined, there is no reason to assume a propylene yield of 30 – 50 wt.% as called for in applicants' independent claims 15 and 21. Further, the prior art references, no matter how combined, would not lead one of ordinary skill in the art to an operation involving the propylene

content of C₃ compounds as set forth in claim 16, the inlet temperature set forth in claim 17 and the space velocity as set forth in claim 18.

Turning now to the additional comments found under “Response to Arguments” starting on page 7 of the Office Action, the disclosure found in Eberly column 1, lines 33-48 regarding removal of “a substantial portion of alumina from the zeolite crystal structure...” does not change the fact that in Eberly the zeolite at the conclusion of the aluminum removal step still contains a very high aluminum concentration. The fact remains that even the “high” silica/alumina mole ratio suggested by Eberly is far below the lowest silica/alumina mole ratio as found in EP ‘060. As noted previously, Eberly refers to the selective removal of alumina and even when “virtually all” of the alumina is removed, the result is a silica/alumina ratio much lower than that involved in applicants’ invention or in EP ‘060.

With respect to the failure in Eberly to address the subject of an MFI-type zeolite, applicants would respectfully submit that the Eberly reference contains nothing in its disclosure to support the proposition that the Eberly disclosure is applicable to “essentially any zeolite.” Eberly addresses certain specific zeolites in column 2, lines 1-19, which, as noted previously, clearly are not MFI-type crystalline silicates. Aside from the fact that the Eberly process appears to be directed to treatment of “as synthesized” zeolites with the templating agent in place, the only basis for one of ordinary skill in the art to attempt to apply Eberly to an MFI-type crystalline silicate is found in applicants’ disclosure and not in the prior art.

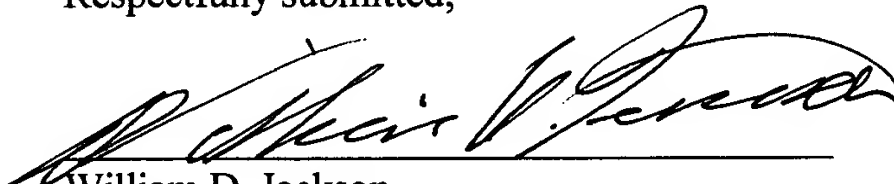
With respect to the disclosure in Eberly regarding higher stability, it is noted that this “higher stability” occurs at a silicon/aluminum atomic ratio of about 20 or less. Clearly, one of ordinary skill in the art considering only the Eberly and ‘060 disclosures would not attempt to apply the Eberly process to arrive at a silicon/aluminum atomic ratio within the claimed range, which is, of course, much, much higher than the maximum value disclosed in Eberly.

Finally, with respect to the propylene yield of 30-50% based upon the olefin content of the feedstock as required in applicants' claims, it will be recalled that early on in the prosecution of this application, the Examiner acknowledged this feature was not disclosed in EP '060, arguing instead for some sort of inherency determination (see top of page 4 of Office Action of June 24, 2002). With respect to Example 24 of EP '060, it is noted that this example refers to the use of silicalite-1, having a silica/alumina ratio of infinity, that is, a silicon/aluminum atomic ratio in excess of the claimed range of 180-1,000. Further, the space velocity in Example 24 is specifically disclosed to be substantially below the range recited in claim 18.

In view of the foregoing reasons and the arguments presented previously in the prosecution of this application, it is respectfully submitted that claims 15-22 are clearly patentable over the combination of EP '060 and Eberly. Accordingly, an early reconsideration and allowance of this application is respectfully requested.

Submitted with this Response is a check in the amount of \$330, the fee for filing terminal disclaimers against the three aforementioned patents. The Commissioner is hereby authorized to charge any additional fee that may be due in connection with the filing of these papers or credit any overpayment to the Locke Liddell & Sapp LLP Deposit Account No. 12-1781.

Respectfully submitted,



William D. Jackson
Registration No. 20,846

Date: September 8, 2004
Locke Liddell & Sapp LLP
2200 Ross Avenue, Suite 2200
Dallas, TX 75201-6776
Telephone: (214) 740-8535
Facsimile: (214) 756-8535